CENTRAL BUCKS
SCHOOL DISTRICT

QUEST

Course Level: Elementary

Grade: Kindergarten

Time/Credit: 40 minutes per week

Development Date: August 2026

School Board Approval:

Central Bucks School District
20 Welden Drive
Doylestown, PA 18901

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Central Bucks School District
Teaching and Learning Principles

1. **QUEST is a process through which students discover how math, science, reading, writing, social studies, and the arts are a daily part of their lives.**
Therefore, we will design lesson plans that require students to apply and integrate the content of our elementary curriculum to solve real world, unpredictable challenges.

2. We are preparing students to be complex thinkers, self-directed learners, effective communicators, responsible citizens, collaborative workers, and quality producers.
Therefore, we will design lesson plans that require students to use skills in critical and creative thinking, communication, and collaboration to explore questions about issues in their natural world and community.

3. Learning takes place when new information is linked with existing knowledge in meaningful ways.
Therefore, it is a priority to ensure students understand why they are learning the content. We will begin instruction with an anticipatory set that demonstrates relevancy to students' lives, scaffold instruction to build on existing knowledge, and close lessons with activities that reinforce the connection and relevancy of the material.

4. Learning involves connecting to the present, the past, and the possibilities of the future.
Therefore, we will make relevant connections to the real world and provide opportunities for students to understand how the present connects to the past and affects the future.

5. The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience.
Therefore, we will help students activate prior knowledge, connect old and new information, and use what they have learned in authentic situations.

6. Process and product are equally important in the learning process.
Therefore, self-reflection and self-assessment will be modeled, and opportunities for self-evaluation and prompt, meaningful feedback will be provided. Our students will receive regular and specific feedback related to progress against standards and timely opportunities to use the feedback to re-do and improve.

7. Technology should be an integral part of the student's experience, enhancing learning and the ability to express ideas.
Therefore, we will model and encourage the use of technology as a tool for instruction, research, application, collaboration, and communication.

8. Research shows active learning is essential.
Therefore, we will design tasks that require students to research, analyze, investigate, solve problems, make decisions, and create products.

9. Learning is social. Our learning is closely associated with our connection with others.
Therefore, we will provide opportunities for students to build relationships with and among each other by facilitating discussions, building empathy, and fostering a climate of intrinsic motivation.

10. Relevance is essential to teaching and learning.
Therefore, learning will include real world exposure, cross-curricular connections, and high interest materials.

11. Learning is most effective when differences in learners' prior knowledge, interests, and strengths are accommodated.
Therefore, we will differentiate instruction and assessment to accommodate different learning styles and educational needs.

12. To maximize learning, students need multiple opportunities to practice and take risks.
Therefore, we will provide a supportive environment based on self-discovery and the respectful exchange of ideas.

13. Motivation influences learning.
Therefore, we will inspire students' curiosity with novel, rigorous, and relevant tasks that provide personal choice and control.

14. Formative assessment is vital for learning.
Therefore, we will create a variety of differentiated assessments that measure knowledge, application of skills, process and product, self-evaluation, and growth.

Central Bucks School District
Enduring Understandings

Students will understand that:

Critical Thinking

• Effective critical thinkers identify and ask significant questions that clarify various points of view and lead to better solutions.
• Effective critical thinkers effectively analyze and evaluate evidence, arguments, claims, and beliefs to make sensible decisions.
• Effective critical thinkers solve different kinds of unfamiliar problems in both conventional and innovative ways.
• Effective critical thinkers reflect critically on learning experiences and processes.
• Effective critical thinkers use digital tools to plan and conduct research, manage projects, solve problems, and make informed decisions.

Communication

• Effective communicators articulate thoughts and ideas using oral, written, and nonverbal communication skills in a variety of forms and contexts.
• Effective communicators understand that communication is an exchange between the sender and the receiver.
• Effective communicators adjust delivery skills to purpose, audience, and occasion.
• Effective communicators select appropriate media and technologies to enhance presentations.

Collaboration

• Effective collaborators exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal.
• Effective collaborators assume shared responsibility for collaborative work, and value the individual contributions made by each team member.
• Effective collaborators are active, critical, and responsible listeners.
• Effective collaborators recognize that communication is essential to understanding themselves and others.
• Effective collaborators use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

Creative Thinking

• Effective creative thinkers elaborate, refine, analyze, and evaluate original ideas to improve and maximize creative efforts.
• Effective creative thinkers demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas.
• Effective creative thinkers view failure as an opportunity to learn and understand that creativity and innovation are part of a long-term, cyclical process of small successes and frequent mistakes.
• Effective creative thinkers act on creative ideas to make a tangible and useful contribution.

• Effective creative thinkers demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

Research

• Effective researchers begin with essential guiding questions.
• Effective researchers understand that the research process is inherently circular and includes the planning, gathering, analyzing, organizing, synthesizing, and evaluating of information.
• Effective researchers select appropriate resources and evaluate information based on accuracy, validity, authority, and relevance.
• Effective researchers draw conclusions, create meaning, and construct new knowledge.
• Effective researchers use information and technology ethically and responsibly to enhance their understanding and present their findings.
• Effective researchers apply research skills to authentic, real-world issues and contexts.
• Effective researchers apply digital tools to gather, evaluate, and use information.

Science and Engineering

• Science is the search for understanding the natural world, and facts, principles, theories, and laws that have been verified by the scientific community and are used to explain and predict natural phenomena and events.
• Engineering is the application of science and mathematics to define real world problems and design solutions.
• Both effective scientists and engineers ask questions and define problems.
• Both effective scientists and engineers develop and use models.
• Both effective scientists and engineers plan and carry out investigations.
• Both effective scientists and engineers analyze and interpret data
• Both effective scientists and engineers use mathematics and computational thinking.
• Both effective scientists and engineers construct explanations and design solutions.
• Both effective scientists and engineers engage in argument from evidence.
• Both effective scientists and engineers obtain, evaluate, and communicate information

Central Bucks School District
Essential Questions

Critical Thinking

- What does it mean to think critically?
- Why is it important to think critically?
- How do effective critical thinkers approach a problem?
- How do effective critical thinkers use conventional and innovative ways to solve unfamiliar problems?
- Why do effective critical thinkers reflect on their learning experiences and processes?
- How do effective critical thinkers use digital tools to plan and conduct research, manage projects, solve problems, and make informed decisions?

Communication

- What is communication?
- Why is effective communication important?
- How do effective communicators articulate thoughts and ideas using oral, written, and nonverbal communication skills in a variety of forms and contexts?
- How do effective communicators adjust delivery skills to purpose, audience, and occasion?
- Why is it important to use appropriate media and technologies to enhance presentations?

Collaboration

- What does it mean to collaborate?
- What are the characteristics of an effective collaborator?
- How do effective collaborators listen?
- How do effective collaborators communicate?
- How do effective collaborators use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others?

Creative Thinking

- What does it mean to think creatively?
- Why is it important to think creatively?
- Why is it important to consider real world limits when developing new ideas?
- How can failure be used as an opportunity to learn?
- How do effective creative thinkers demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology?

Research

- What is the value of research?
- What can be discovered or created through research?
- What makes an effective researcher?
- How do effective researchers apply research skills to authentic, real-world issues and contexts?
- How do effective researchers apply digital tools to gather, evaluate, and use information?

Science and Engineering

- What is the difference between science and engineering?
- What skills do scientists use to explore and understand our world?
- What skills do engineers use to define real world problems and design solutions?

Central Bucks School District – Course of Study Overview
QUEST

Desired Results

QUEST Course Description:

QUEST is an interdisciplinary approach to learning where rigorous academic concepts are coupled with real world challenges that allow students to apply 21st century skills to become informed citizens and life-long learners. Each unit of study is built around a real-world challenge that ties directly to classroom instruction and requires students to apply cross-curricular skills. Further, the curriculum is heavily focused on teaching students how to use and incorporate technology in new ways.

Kindergarten QUEST Course Description:

Kindergarten QUEST students will be given opportunities to explore the concepts of the engineering design process and 21st century skills. Units of study connect directly to the kindergarten curriculum in science, mathematics, social studies, reading, writing, and art. Emphasis will be placed on safely and responsibly using tools to complete tasks. Further, the units introduce students to a variety of technology they can use to solve real-life problems such as creation iPad apps, basic computer programming, and robotics.

Acceptable Evidence.

Assignments, Performance Tasks, Projects, Tests, etc.:

- Informal and Formal Critiques of 21st Century Skills, specifically collaboration
- Engineering products (solutions to real world problems)
- Student Presentations

QUEST Kindergarten – Pacing Guide

Content	Days
Unit 1 -	
"Welcome to QUEST" Lesson 1- Introduction to engineering and the 4 Cs (collaboration, communication, creativity, and critical thinking skills) Lesson 2- Practice safely and responsibly using tools to complete a task. **Engineering with the Three Little Pigs** Lesson 1- **The Three Little Pigs Mega Block Build-**Solve the characters' problem by engineering using Mega Blocks. Lesson 2- **The Three Little Pigs Structures Block Build**- Solve the characters' problem by engineering with Structures Blocks. Lesson 3- **The Three Little Pigs Magna Tile Build**- Solve the characters' problem by engineering with Magna Tiles. Lesson 4 (2 days)- **The Three Little Pigs Final Build and Puppet Show-** Choose a favorite building material to engineer a solution to the characters' problem. Collaborate with others to retell the story using puppets.	7 days
Unit 2 -	
Coding with Indi Robots Lesson 1- **Unplugged Lesson-** Coding with Magna Tiles Lesson 2- **Meet Indi-** Identify key parts of Indi and explain what they do. Demonstrate how Indi works. Lesson 3- **Left or Right?-** Move Indi left and right. Design a route around obstacles for Indi to follow. Lesson 4- **Patterns-** Identify patterns and correctly identify what comes next in a pattern. Complete a pattern to successfully guide Indi. Lesson 5 (2 days)- **Coding with Kodable-** Introduce sequencing and debugging using the Kodable app. Lesson 6 (2 days)- **Coding with Code.org**- Utilize coding skills to drag and drop, attach blocks of code, sequence, debug, and add loops. Lesson 7- **Coding with Scratch Jr.- Friendly Playground-** Program one sprite to greet another stationary sprite using movement and looks blocks. Initialize programs to begin with a Start on Green Flag and Go Home (Return to X). Lesson 8 (2 days)- **Indi's Day Out-** Create a map and incorporate Indi's color tiles to create routes for Indi to follow to visit different places in the community.	11 days
Unit 3 -	
Storybook STEM- The Three Billy Goats Gruff Lesson 1- **Build a Bridge with Magna Tiles-** Identify the characters, setting, and problem of the story. Use Magna Tiles to build a bridge to solve the characters' problem. Lesson 2- **Build a Bridge with Wood-** Compare two different versions of the story. Build a wooden bridge to help the goats stay safe from the troll. Make a troll puppet. Lesson 3- **Build a Bridge with Blocks-** Listen to a third version of the story and make comparisons. Use Duplo Blocks to build a bridge. Compare materials. Lesson 4- **Build a Custom Bridge-** Listen to one more version of the story. Build a bridge to help the goats stay safe from the troll using materials of your choice.	4 days
Unit 4-	
LEGO EDU Science- Push and Pull	10 days

Lesson 1- **LEGO Science EDU**- Learn about the kit and free-build with the materials. Lesson 2**- LEGO Science EDU- Dino Birthday Bash**- Investigate the effects of pushes and pulls on the motion of an object. Lesson 3- **LEGO Science EDU- Muddy Rhino**- Design a solution to change the direction of a moving object with a push or a pull and then test if it works as intended. Lesson 4- **LEGO Science EDU- Feeding Time**- Conduct an investigation to compare the effects of different push strengths on the motion of an object. Lesson 5- **LEGO Science EDU- Winning Shot-** Make observations and analyze data to determine the effects of a push or a pull on a model. Lesson 6- **LEGO Science EDU- Ducks in a Row-** Determine if they need a push or a pull to solve a problem. Lesson 7- **What Is a Magnet?-** Understand that all magnetic objects are metal. Experiment with magnets to determine which objects are magnetic and which objects are not magnetic. Lesson 8- **Estimating with Magnets-** Estimate and test objects (paperclips, washers, coins) to see how many can be picked up by a magnet. Lesson 9 (2 days)- **5 Little Ducks Magnet Maze-** Apply understanding of the forces of push and pull by using magnets to navigate a maze in order to help a mother duck find her baby ducks.	
Unit 5-	
Digital Literacy Lesson 1- **Digital Citizenship: Caring for Our Devices-** Understand what it means to be responsible for something and identify ways to take care of their device. Lesson 2- **AI Literacy: Artificial vs. Natural-** Recognize the difference between artificial and natural objects. Identify examples of artificial and natural items in their environment. Understand that artificial items are made by humans.	2 days

NOTE: Additional remediation in standards/content from the grade level where the student completes this course will be provided for students when the teacher determines a student has not yet mastered that content. Enrichment opportunities will also be provided to meet the needs of students that acquire an understanding of the content faster than their classmates.

Required Texts and Software

Trade books used within the curriculum:
One by Kathryn Otoshi
Three Little Pigs by Giuseppe Di Lernia
Three Billy Goats Gruff (multiple versions)
Five Little Ducks by Raffi
Me on the Map by Joan Sweeney

Software used within the curriculum:
Code.org
Kodable coding app
Scratch Jr. coding app

Central Bucks School District – QUEST – Kindergarten
Unit 1 – Welcome to QUEST: Engineering with the Three Little Pigs

Desired Results:

Essential Questions:

- What skills do engineers use to define real world problems and design solutions?
- How can collaborating with others enhance creativity?
- How can you use the individuality of all members of your group to ensure all designs are considered?
- How can you use common classroom materials to create solutions to problems?
- What is the engineering design process and how is it used to create?
- How can you safely and responsibly use appropriate tools to complete a task?

Enduring Understandings:

Students will understand that…

- Collaboration can foster creativity and innovative thinking.
- There are different solutions to a design.
- Certain materials possess desirable properties and characteristics for use in creating solutions to problems.
- The engineering design process is a series of steps (Ask, Imagine, Plan, Create, Test, Improve, Share) used to create
- There are ways to safely and responsibly use appropriate tools to complete a task.

Knowledge:

Students will know…

- Vocabulary: collaborate, create, engineer, imagine, problem, solution, tools
- The process of an engineer.
- How to apply the steps of the engineering design process to create solutions to problems.
- The essential components of a design plan.

Skills:

Students will be able to…

- Practice expected routines and procedures for the QUEST room.
- Explore and build with a variety of materials.
- Formulate an understanding of the term engineer.
- Safely use appropriate tools to complete tasks (crayons, scissors, tape).
- Collaborate with others by sharing ideas and materials.

Standards:

<u>Priority:</u>

<u>STEELS Standards</u>

3.5.K-2.K- Safely use tools to complete tasks.

3.5.K-2.O- Illustrate that there are different solutions to a design and none are perfect

3.5.K-2.S- Apply design concepts, principles, and processes through play and exploration

3.5.K-2.AA Demonstrate that creating can be done by anyone

3.5.K-2.DD- Collaborate effectively as a member of a team.

Acceptable Evidence:

Performance Tasks –
Students will collaboratively create prototypes of inventions to help solve the problems of storybook characters.

Real-World Challenge-
Empathy is the first stage of the design thinking process. It is the ability to understand and feel the problems and realities of the people you are designing for. Empathy helps you create better solutions that meet the needs of your end users. The real-world challenge is- "The three little pigs are in trouble! Can you collaborate with others by using the engineering design process to design and create a solution that will help them?".

Acceptable evidence of learning other than Performance Tasks:
Formative Assessment- Teacher observation, anecdotal notes, student self-reflection (collaboration skills), design planning sheets, exit tickets.

Suggested Learning Experiences and Instruction

Learning Experiences:

- Students will be introduced to QUEST and understand what they will learn and do in this class.
- Students will listen to the story **The Three Little Pigs**.
- Students will solve the characters' problem by engineering using Mega Blocks.
- Students will understand clean-up routines and learn the Clean-Up song.
- Students will be introduced to the "Tool of the Day"- crayons.
- Students will safely and responsibly use crayons to color a puppet.
- Students will solve the characters' problem by engineering using Structures Blocks.
- Students will practice clean-up routines.
- Students will be introduced to the "Tool of the Day"- scissors.
- Students will safely and responsibly use scissors to cut out a puppet.
- Students will solve the characters' problem by engineering using Magna Tiles.
- Students will be introduced to the "Tool of the Day"- masking tape.
- Students will use masking tape to assemble a puppet.
- Students will choose a favorite building material to engineer a solution to the characters' problem.
- Students will collaborate with others to retell the story using the puppets.

Instructional Strategies:
Direct Instruction (.59), Class Discussion (.82), Cooperative vs. Individualistic Learning (.55), Problem Solving Teaching (.67)

Differentiation/Intervention/Enrichment Options:

- Assign specific roles and responsibilities during collaborative group work to draw upon students' strengths.
- Use alternative materials to allow for differentiation.

<u>For Language Development</u>:

- Utilize picture cards and other visual supports to reinforce vocabulary.
- Use translation features when presenting information digitally.

Central Bucks School District – QUEST – Kindergarten
Unit 2 – Coding with Indi

Desired Results:

Essential Questions:

- How does language evolve?
- How do coded commands instruct a computer?
- Is there only one way to write code?
- How can we direct a model to move in a certain way?
- How can the movements of an object be changed?
- Why do engineers make changes to their design?
- How can technology be used in a different way?

Enduring Understandings:

Students will understand that…

- Technology can be used to create and communicate ideas.
- Language evolves by adapting to technology and needs. Code is a language that helps people communicate with computers.
- Coded commands provide sequential directions for a task.
- Codes can be written in many ways depending on the technology and task.
- We can change the movements of an object by changing the code.
- Using feedback from the machine, engineers change or improve their design.

Knowledge:

Students will know…

- Vocabulary: code, color sensor, debugging, electric motor, LED light, loop, obstacle, pattern, repeat, robot, sequencing, speaker, sprite, turn
- Coding related terminology and problem solving through computer programming.

Skills:

Students will be able to…

- Utilize coding skills to drag and drop, attach blocks of code, sequence, debug, and add loops.
- Identify key parts of a robot and explain what they do.
- Demonstrate how a robot works.
- Complete a pattern to successfully guide a robot along a route and around obstacles.
- Collaborate with a team and use effective communication skills.
- Identify places in the community.
- Create a map and create routes for a robot to follow to visit different places in the community.

Standards:

Priority:

CSTA Standards

1A-CS-02- Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).

1A-CS-03- Describe basic hardware and software problems using accurate terminology.

1A-DA-06- Collect and present the same data in various visual formats.

1A-DA-07- Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.

1A-AP-08- Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.
1A-AP-09- Model the way programs store and manipulate data by using numbers or other symbols to represent information.
1A-AP-10- Develop programs with sequences and simple loops, to express ideas or address a problem.
1A-AP-11- Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
1A-AP-12- Develop plans that describe a program's sequence of events, goals, and expected outcomes.
1A-AP-14- Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.
1A-IC-17 - Work respectfully and responsibly with others online.

STEELS Standards
3.5.K-2.N Analyze how things work.
3.5.K-2.W Apply concepts and skills from technology and engineering activities that reinforce concepts and skills across multiple areas.
3.5.K-2.DD Collaborate effectively as a member of a team.

Supporting:
Social Studies Standards
7.2.K.A- Describe the characteristics of homes and businesses located in the community to gain an understanding of physical features.

Acceptable Evidence:

Performance Tasks –
Students will collaborate with a team and use effective communication skills to create a map and design routes for a robot to follow to visit different places in the community.

Real-World Challenge-
Writing code is essential for computer programming. This unit will expose students to the idea of approaching computer tasks in a sequential order, the first step in understanding coding. To begin, students will be asked, "Can you create code using color tiles and patterns to program a robot to move?"
Once students can "write" a computer program they will use this skill to solve the following real-life challenge: In this robotics activity, students will be challenged to work collaboratively with others to create a map of their community. They will then work together to code their robot to visit various locations around the community.

Acceptable evidence of learning other than Performance Tasks:
Formative Assessment- Teacher observation, anecdotal notes, student self-reflection (collaboration skills), design planning sheets, exit tickets.

Suggested Learning Experiences and Instruction

Learning Experiences:

- Students will play an "unplugged" coding game with a partner to learn about sequencing and programming.
- Students will identify key parts of the Indi robot and explain what they do.
- Students will use the terms: Electric motor, LED light, color sensor, speaker.
- Students will demonstrate how the Indi robot works.
- Students will move the Indi robot left and right.

- Students will design a route around obstacles for the Indi robot to follow.
- Students will identify patterns around them.
- Students will correctly identify what comes next in a pattern.
- Students will complete a pattern to successfully guide the Indi robot.
- Students will utilize coding skills to sequence and debug using the Kodable app.
- Students will utilize coding skills to drag and drop, attach blocks of code, sequence, debug, and add loops using the Code.org program.
- Students will understand the Scratch Jr. coding platform.
- Students will program one sprite to greet another stationary sprite using movement and looks blocks.
- Students will initialize their programs to begin with a Start on Green Flag and Go Home (Return to X).
- Students will collaborate with a team and use effective communication skills.
- Students will identify places in the community.
- Students will create a map and incorporate Indi's color tiles to create routes for Indi to follow to visit different places in the community.

Instructional Strategies:
Direct Instruction (.59), Class Discussion (.82), Cooperative vs. Individualistic Learning (.55), Problem Solving Teaching (.67)

Differentiation/Intervention/Enrichment Options:

- Assign specific roles and responsibilities during collaborative group work to draw upon students' strengths.
- Use alternative materials to allow for differentiation.

For Language Development:

- Utilize picture cards and other visual supports to reinforce vocabulary.
- Use translation features when presenting information digitally.

Central Bucks School District – QUEST – Kindergarten
Unit 3 – Storybook STEM: The Three Billy Goats Gruff

Desired Results:

Essential Questions:

- What skills do engineers use to define real world problems and design solutions?
- How can collaborating with others enhance creativity?
- How can you use the individuality of all members of your group to ensure all designs are considered?
- How can you use common classroom materials to create solutions to problems?
- What is the engineering design process and how is it used to create?
- How can you safely and responsibly use appropriate tools to complete a task?

Enduring Understandings:
Students will understand that…

- Collaboration can foster creativity and innovative thinking.
- There are different solutions to a design.
- Certain materials possess desirable properties and characteristics for use in creating solutions to problems.
- The engineering design process is a series of steps (Ask, Imagine, Plan, Create, Test, Improve, Share) used to create.
- There are ways to safely and responsibly use appropriate tools to complete a task.

Knowledge:
Students will know…

- Vocabulary: collaborate, create, engineer, imagine, problem, solution, tools
- The process of an engineer.
- How to apply the steps of the engineering design process to create solutions to problems.
- The essential components of a design plan.

Skills:

Students will be able to…

- Practice expected routines and procedures for the QUEST room.
- Explore and build with a variety of materials.
- Formulate an understanding of the term engineer.
- Safely use appropriate tools to complete tasks (crayons, scissors, tape)
- Collaborate with others by sharing ideas and materials.

Standards:
<u>Priority:</u>
<u>STEELS Standards</u>
3.5.K-2.K- Safely use tools to complete tasks.
3.5.K-2.O- Illustrate that there are different solutions to a design and none are perfect
3.5.K-2.S- Apply design concepts, principles, and processes through play and exploration
3.5.K-2.AA Demonstrate that creating can be done by anyone
3.5.K-2.DD- Collaborate effectively as a member of a team.

Acceptable Evidence:

Performance Tasks –
Students will collaboratively create prototypes of inventions to help solve the problems of storybook characters.

Real-World Challenge-
Empathy is the first stage of the design thinking process. It is the ability to understand and feel the problems and realities of the people you are designing for. Empathy helps you create better solutions that meet the needs of your end users. The real-world challenge is- "The Three Billy Goats Gruff need your help to safely cross the river! Can you collaborate with others by using the engineering design process to design and create a solution that will help them?".

Acceptable evidence of learning other than Performance Tasks:
Formative Assessment- Teacher observation, anecdotal notes, student self-reflection (collaboration skills), design planning sheets, exit tickets.

Suggested Learning Experiences and Instruction

Learning Experiences:

- Students will listen to the story **The Three Billy Goats Gruff**
- Students will identify the characters, setting and problem of the story.
- Students will help the characters solve their problem by engineering a bridge using Magna Tiles.
- Students will understand clean-up routines and practice the Clean-Up song.
- Students will safely and responsibly use tools to create a troll puppet.
- Students will help the characters solve their problem by engineering a bridge using Structures Blocks.
- Students will practice clean-up routines.
- Students will compare different versions of the story.
- Students will help the characters solve their problem by engineering a bridge using Mega Blocks.
- Students will compare the effectiveness of each building material.
- Students will choose a favorite building material to engineer a solution to the characters' problem.

Instructional Strategies:
Direct Instruction (.59), Class Discussion (.82), Cooperative vs. Individualistic Learning (.55), Problem Solving Teaching (.67)

Differentiation/Intervention/Enrichment Options:

- Assign specific roles and responsibilities during collaborative group work to draw upon students' strengths.
- Use alternative materials to allow for differentiation.

For Language Development:

- Utilize picture cards and other visual supports to reinforce vocabulary.
- Use translation features when presenting information digitally.

Central Bucks School District – QUEST – Kindergarten
Unit 4– LEGO Science EDU Push and Pull

Desired Results:

Essential Questions:

- Can pushes and pulls have different strengths and directions?
- Can we change the speed and direction of an object by pushing or pulling it?
- What does a bigger push or pull do to an object?
- What are the similarities among magnetic and non-magnetic objects?
- How do magnets interact with each other and other objects?
- What does it mean to collaborate?

Enduring Understandings:

Students will understand that…

- Pushes and pulls can have different strengths and directions.
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
- A bigger push or pull makes things speed up or slow down more quickly.
- There are similarities among both magnetic objects and nonmagnetic objects.
- Magnets interact with all things made of iron and with other magnets to produce motion without touching them.
- Effective collaborators assume shared responsibility for collaborative work, and value the individual contributions made by each team member.

Knowledge:

Students will know…

- Vocabulary: attract, direction, magnet, metal, problem, pull, push, solution, strength
- How to follow directions to build a model.
- How to collaborate with others to accomplish a common goal.
- How to conduct an investigation and test objects.

Skills:

Students will be able to…

- Investigate the effects of pushes and pulls on the motion of an object.
- Design a solution to change the direction of a moving object with a push or a pull and then test if it works as intended.
- Conduct an investigation to compare the effects of different push strengths on the motion of an object.
- Define a simple problem and solve it by developing an object or tool.
- Define a problem that can be solved through the development of an improved object and test their solution.
- Understand that some metals are magnetic.
- Demonstrate effects of magnets on different objects.
- Experiment with magnets to understand magnetic properties of different materials.
- Describe qualities of different items (i.e. weight, magnetism, etc…)

Standards:

<u>Priority:</u>

<u>STEELS Standards</u>

3.2.K.A Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.
3.2.K.B Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
3.5.K-2.B Describe qualities of everyday products.
3.5.K-2.K Safely use tools and complete tasks.
3.5.K-2.N Analyze how things work.
3.5.K-2.O Illustrate that there are different solutions to a design and that none are perfect.
3.5.K-2.S Apply design concepts, principles, and processes through play and exploration.
3.5.K-2.T Demonstrate that designs have requirements.
3.5.K-2.U Explain that design is a response to wants and needs.
3.5.K-2.V Explain that materials are selected for use because they possess desirable properties and characteristics.
3.5.K-2.W Apply concepts and skills from technology and engineering activities that reinforce concepts and skills across multiple areas.
3.5.K-2.AA Demonstrate that creating can be done by anyone.
3.5.K-2.DD Collaborate effectively as a member of a team.

Acceptable Evidence:

Performance Tasks – Students will collaborate with a partner to apply their knowledge of magnetism and the forces of push and pull to navigate a magnetic "mother duck" through a maze to find her lost babies.

Real-World Challenge-
Teaching the motion of push and pull to kindergarten students helps them understand that forces are what make objects move. This foundational knowledge is crucial for their understanding of physics and motion. By learning about push and pull, students can apply their knowledge in real-world situations, such as moving furniture or playing with toys that require pushing or pulling.
In this real-world challenge, the students will apply their knowledge of the forces of push and pull and their understanding of magnetism to help a mother duck find her lost baby ducks.

Acceptable evidence of learning other than Performance Tasks:
Formative Assessment
Teacher observation, anecdotal notes, student self-reflection (collaboration skills), design planning sheets, rubrics, exit tickets.

Suggested Learning Experiences and Instruction

Learning Experiences:

- Students will explore with the LEGO EDU Science kit materials and free-build with their partners.
- Students will investigate the effects of pushes and pulls on the motion of an object by helping a LEGO dinosaur bring presents to a birthday party.
- Students will design a solution to change the direction of a moving object with a push or a pull and then test if it works as intended by trying to get a muddy LEGO rhinoceros to take a bath.
- Students will conduct an investigation to compare the effects of different push strengths on the motion of an object by helping to feed some hungry LEGO animals.
- Students will define a simple problem and solve it by developing an object or tool to help some LEGO ducks safely cross the road.

- Students will define a problem that can be solved through the development of an improved object and test their solution by helping someone skateboard on a rocky road.
- Students will understand that all magnetic objects are metal.
- Students will experiment with magnets to determine which objects are magnetic and which objects are not magnetic.
- Students will appropriately use the “tool of the day”- glue sticks.
- Students will effectively collaborate with a partner to complete a task.
- Students will test objects (paperclips, washers, coins) to see how many can be picked up by a magnet.
- Students will write down their estimate and what actually happened.
- Students will use magnets to move an object through a maze.

Instructional Strategies:
Direct Instruction (.59), Class Discussion (.82), Cooperative vs. Individualistic Learning (.55), Problem Solving Teaching (.67)

Differentiation/Intervention/Enrichment Options:

- Assign specific roles and responsibilities during collaborative group work to draw upon students’ strengths.
- Use alternative materials to allow for differentiation.

For Language Development:

- Utilize picture cards and other visual supports to reinforce vocabulary.
- Use translation features when presenting information digitally.

Central Bucks School District – QUEST – Kindergarten
Unit 5– Digital Literacy

Desired Results:

Essential Questions:

- How can we tell if something is natural or made by people?
- What things in our world come from nature?
- What things have people created or built?
- How do devices help people learn and work?
- How can we use devices safely and responsibly?

Enduring Understandings:

Students will understand that…

- Natural things occur in nature and are not made by people.
- Artificial things are created, built, or designed by humans.
- We can find both natural and artificial objects in our homes, schools, and communities.
- Technology can help us learn, create, and solve problems when used appropriately.
- Responsible device users follow rules, handle devices carefully, and ask a trusted adult for help when needed.
- We can make thoughtful choices about when and how to use technology.

Knowledge:

Students will know…

- Vocabulary: care, device, responsibility, artificial, natural
- Objects can be grouped into two categories: natural things and artificial (human-made) things.
- Natural objects come from nature and are not created by people (e.g., trees, rocks, flowers, animals).
- Artificial objects are made or designed by humans (e.g., toys, books, cars, computers, tablets).
- People create technology to help solve problems, communicate, learn, and complete tasks.
- Natural and artificial objects exist all around them in their homes, schools, and communities.
- Observing characteristics of objects can help them determine whether something is natural or human-made.
- Responsible device use is important for learning and safety.
- Technology should be used carefully and respectfully by following classroom and family rules.
- Trusted adults help children use technology safely and appropriately.

Skills:

Students will be able to…

- Understand what it means to be responsible for something.
- Identify ways to care for their device.
- Recognize the difference between artificial and natural objects.
- Identify examples of artificial and natural items in their environment.
- Understand that artificial items are made by humans.

Standards:

<u>Priority:</u>

<u>STEELS Standards</u>

3.5.K-2.B Describe qualities of everyday products.

3.5.K-2.K Safely use tools to complete tasks.
3.5.K-2.N Analyze how things work.
3.5.K-2.BB Compare the natural world and human-made world.

Acceptable Evidence:

Performance Tasks – The students will create a Device Care Tips picture chart to illustrate and share strategies for keeping devices safe, clean, and in good working condition. Students will categorize objects as either natural or artificial by sorting them into an interactive chart.

Acceptable evidence of learning other than Performance Tasks:
Formative Assessment
Teacher observation, anecdotal notes, student self-reflection (collaboration skills), design planning sheets, rubrics, exit tickets.

Suggested Learning Experiences and Instruction

Learning Experiences:

- Students will engage in a class discussion about caring for people, pets, and cherished belongings, making connections to the importance of taking care of technology devices.
- Students will read and discuss a device-care limerick that reinforces key practices for using and handling technology responsibly.
- Students will create a Device Care Tips picture chart to illustrate and share strategies for keeping devices safe, clean, and in good working condition.
- Students will explore the difference between natural objects and artificial (human-made) objects, learning that artificial items are created by people.
- Students will participate in an interactive sorting activity in which they classify objects as either natural or artificial.
- Students will take part in a school or outdoor observation walk to identify examples of natural and artificial objects in their environment. Students will document their observations by either taking photographs with their iPads or creating drawings with paper and pencil.

Instructional Strategies:
Direct Instruction (.59), Class Discussion (.82), Cooperative vs. Individualistic Learning (.55), Problem Solving Teaching (.67)

Differentiation/Intervention/Enrichment Options:

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